

WHAT IS CLAIMED IS:

Sub A1
5 1. An audio communication system for use in a computer station of a computer network, said computer station having a network interface, a microphone and a speaker, said communication system comprising:

an audio responsive input unit which accepts analog audio waveform signals from the microphone and digitizes the audio waveform signals;

10 an audio output unit which converts digital audio waveform signals to analog audio waveform signals for audible output by the speaker; and

15 a controller coupled to said audio responsive input unit, to said audio output unit, and to said network interface, said controller configured to accept the digitized audio signals from said audio responsive input unit and to provide the signals in audio data packets for transmission over the computer network, said controller further configured to accept audio data packets from said network and to transfer said audio data packets to said audio output unit, said controller managing the operations of the audio communication system without substantially interfering with other application programs operating on the computer.

20 2. The audio communication system of Claim 1, wherein said audio responsive unit comprises a sound activated audio responsive unit activated by audio signals to begin processing the audio data.

30 3. The audio communication system of Claim 1, wherein said audio responsive input unit further comprises an analog to digital convertor and a compressor, and wherein said audio output unit comprises a digital to analog to digital convertor and an expander.

35 4. The audio communication system of Claim 1, wherein said audio responsive input unit comprises a variable sensitivity audio responsive input unit which responds to signals from said controller to vary the sensitivity of the

audio responsive unit to audio waveform signals from the microphone.

5 5. The audio communication system of Claim 1, wherein said audio output unit comprises a variable volume level audio output unit which responds to signals from said controller to vary the volume level provided by the audio responsive unit to the speaker.

10 6. The communication system of Claim 1, wherein said packets comprise a status field which contains data which reflects an operative communication state of the computer, an arbitration field which contains data which reflects an arbitration value, and an audio data field which contains compressed digital audio waveform data.

15 7. The audio communication system of Claim 6, wherein the controller further comprises an arbitration module which determines without handshaking, which of at least two computers in the computer network will continue to transmit audio data when said at least two computers simultaneously begin sending audio data.

20 8. A audio communication system operative in network computer stations on a computer network, the network computer stations having audio output and audio input hardware, said system comprising:

25 a user interface having a plurality of user selections;

 a computer station audio communication state data structure which contains a value indicative of one of a plurality of operative states of the audio communication system;

30 a main control block which controls the overall operation of the two-way audio communication system, said main control task responsive to said user selections, said main control block further monitoring the state contained in the computer station audio communication state data structure, said main control block configured to operate without substantially

35

interfering with the operation of other systems on said network computer stations;

5 a first network communication block which accepts audio data from said audio input hardware and indicates to the network that data is available for transmission; and

10 a second network communication control block which accepts audio data transferred over the network and provides the data to the audio output hardware of the user station.

9. The audio communication system of Claim 8, further comprising:

15 an audio input control block which accepts audio data from said audio input hardware, compresses the data, combines the data with the operative state of the network computer and provides the data to the first network communication control block; and

20 an audio output control block which accepts audio data from said second network communication control block, wherein the data is compressed audio data, expands the compressed audio data and provides the data to the audio output hardware of the network computer.

25 10. The audio communication system of Claim 8, wherein said user selections comprise a dial selection, an answer selection, a hang up selection, a louder selection, a softer selection, a more sensitive selection, a less sensitive selection, and an auto answer selection.

11. The audio communication system of Claim 9, wherein each control block is an interrupt activated control block.

30 12. The audio communication system of Claim 9, wherein each control block operates concurrently, and operates without significantly interfering with application programs not associated with the communication system.

35 13. The audio communication system of Claim 9, wherein the audio input control block is activated upon detection of audio signal from the microphone.

14. The audio communication system of Claim 9, wherein the compression occurs at a pre-selected ratio, said pre-selected ratio comprising a further user selection.

5 15. A method of carrying out audio communication between users of at least two computer stations in a computer network, said method comprising the steps of:

establishing a connection between the at least two computers on the network with a first of said at least two computer stations;

10 receiving audio waveform input data at the first station;

digitizing said audio waveform data to obtain digital audio waveform data;

generating a first random arbitration value;

15 combining said digital audio waveform data with a communication state of the first station and with the random arbitration value generated by said first station to form a digital audio data packet;

20 transmitting the digital audio data packet over the network to a second of said at least two computers on the network;

receiving the audio data packet at said second computer station;

25 converting the digital audio data from the packet to analog form to obtain analogy audio waveform data; and

transferring the analog audio waveform data to a speaker to generate audible signals.

30 16. The method of Claim 15, further comprising the steps of:

compressing said digital audio waveform data prior to combining said digital audio waveform data with the communication state and the random arbitration value; and

expanding the digital audio data at said second computer station prior to converting the digital audio data from said packet to analog form.

Sub 5 A2
17. An audio communication system for use in a computer station, said computer station having a microphone and a speaker, said communication system comprising:

an audio responsive input unit which accepts analog audio waveform signals from the microphone and digitizes the audio waveform signals;

10 an audio output unit which converts digital audio waveform signals to analog audio waveform signals for audible output by the speaker;

a data storage system; and

15 a controller in communication with said audio responsive input unit, to said audio output unit, and to said data storage system, said controller configured to accept the digitized audio signals from said audio responsive input unit and to store the digitized audio signals in the data storage system, said controller
20 managing the operations of the audio communication system without substantially interfering with other application programs operating on the computer.

25 18. The audio communication system of Claim 17, wherein the controller is further configured to retrieve the digitized audio signals from the data storage system and provide the digitized audio signals to the audio output unit.

30 19. The audio communication system of Claim 17, wherein said audio responsive unit comprises a sound activated audio responsive unit activated by audio signals to begin processing the audio data.

35 20. The audio communication system of Claim 17, wherein the computer is a network computer and has a network interface, said controller further in communication with the network interface and configured to provide the audio signals in audio data packets for transmission over the computer network, and further configured to accept audio data packets

from said network ~~and~~ to transfer said audio data packets to
said audio output unit.